

Research

Exploring the key factors influencing the actual usage of digital tax platforms

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Received: 18 November 2023 / Accepted: 1 April 2024

Published online: 13 May 2024

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Abstract

In this groundbreaking study, we explore the behavioral determinants critical to the acceptance and effective utilization of Jordan's digital tax platform among taxpayers. Utilizing an unprecedented combination of frameworks from the Technology Acceptance Model (TAM), Social Capital Theory (SCT), and Theory of Reasoned Action (TRA), this study pioneers a unique integrated approach. Data gathered through questionnaires across Jordan's multiple governorates lay the groundwork for this analysis. Employing the sophisticated Partial Least Squares Structural Equation Modeling (PLS-SEM) within SPSS, our results uncover the profound impact of both social factors (trust, subjective norms) and technological attributes (perceived ease, utility), as conceptualized in TAM, SCT, and TRA. This research is distinct in its focus on Jordan, providing new insights into the nexus of tax compliance and technology adoption, a relatively uncharted area in existing literature.

Keywords Digital taxation · Behavioral determinants · Jordan · e-Government adoption · TAM · SCT · TRA

Abbreviations

TAM	Technology Acceptance Model
SCT	Social Capital Theory
TRA	Theory of Reasoned Action
ICTs	Information and Communication Technologies
PU	Perceived usefulness
PEOU	Perceived ease of use
PLS	Partial least squares
TOE	Technological, Organizational, and Environmental

1 Introduction

In the realm of public finance, taxes are a foundational pillar supporting the economic, social, and administrative structures of countries. Besides its primary role in generating revenue, taxes, as highlighted by Atwood et al. [1], help stabilize economic fluctuations, thus maintaining fiscal stability and ensuring a fair distribution of wealth.

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Towards the close of the twentieth century, technological innovation accelerated at an unprecedented pace. This rapid evolution transformed traditional governmental functions, giving rise to what is internationally termed as 'e-government'. As articulated by Grönlund and Horan [2], this shift symbolizes a significant transformation in the relationship between the state and its citizens, facilitated by the adept use of Information and Communication Technologies (ICTs).

The Hashemite Kingdom of Jordan, a notable Middle Eastern nation, adeptly adopted this technology to enhance its public service delivery. Jordan initiated its digital transformation in 2001 with the introduction of the National E-Government Strategy, which received royal endorsement.

The concept of "tax", essential for governmental revenue in nearly all countries, is multifaceted. Beyond being a revenue mechanism, it has economic, social, and regulatory ramifications. Taxes not only finance governmental functions but also regulate inflation and promote societal equity through the distribution of wealth [1]. From the 1990s onwards, to refine and optimize service delivery, governments globally began adopting electronic platforms, leading to the rise of the e-government model [3]. According to Al-Refaie and Ramadna [4], e-government illustrates the capacity of ICTs to redefine governmental engagements with its citizenry, businesses, and other governmental entities.

In 2005, the Jordanian Income and Sales Tax Department introduced its e-government initiative, aligning with global digital governance trends. A significant aspect of this was the e-tax service, which signaled not just a new method, but a step toward modern governance, making tax processes more efficient [5].

This online taxation system overcomes traditional red tape by allowing electronic submissions of tax returns. Without the need for face-to-face interactions, it provides a more efficient, less error-prone, and transparent tax process, encouraging tax compliance [6].

Jordan provides an intriguing case study for this topic. Despite being a newcomer to e-governance, its unique political, social, and economic environment sets it apart. While navigating regional instability and economic challenges, Jordan remains committed to using technology for public good. The country's blend of traditional values and a tech-aware younger generation adds complexity to the digital adoption scenario, making it an ideal context for studying e-tax adoption.

However, the e-tax platform, despite its benefits, faces numerous challenges, especially in user engagement. While existing studies touch on this issue, there remains a clear gap in understanding the preferences of Jordanian taxpayers. To address this gap, this research will explore the following question: What are the combined behavioral and technological factors that influence the actual use of the Jordanian Digital Tax Platform by taxpayers, and how can these insights inform strategies to enhance its adoption and effectiveness?

This research aims to fill this void, exploring why Jordanian taxpayers are drawn to or resist the e-tax platform. This isn't merely a theoretical exercise; the findings have real-world implications. Insights gained will be valuable for software designers and Jordanian policymakers, guiding improvements in the e-tax system.

This study draws upon well-established theories, including the Technology Acceptance Model (TAM) and the Social Capital Theory (SCT). Data will be collected through detailed questionnaires, targeting a wide range of taxpayers in Jordan. The data will be analyzed using the partial structural equation model of least squares (PLS-SEM), using SPSS software.

The following sections of this paper will provide a detailed literature review. This will be followed by a discussion on the research methodology used. After that, we'll present the data analysis and our findings, and conclude with our recommendations.

2 Literature review

2.1 Background of the digital tax system

With the rapid advancement of technology, governments have been moving towards digitally transforming their services. This is a shift that goes beyond just offering services online; it's about leveraging technology to improve efficiency, user experience, and overall service quality. A prime example of this transformation is the digital tax system. This system has been introduced in various contexts, including the notion of "electronic tax" [5]. The digital tax filing concept allows citizens to submit and pay their taxes directly over the internet, eliminating the need to manually complete forms and visit the tax department [6]. Broad objectives of any digital tax system include enhancing tax collection efficiency, expanding tax filing and payment options, improving information quality and accuracy,

supporting digital government initiatives, enhancing service delivery, and reducing costs for both taxpayers and revenue departments [7].

2.2 Effects of the digital transformation in the tax system

Research has emphasized that the adoption of the digital tax system is influenced by various behavioral factors. In a Malaysian study, the usability of the digital tax platform was positively linked with its ease of use and the perceived benefits. This relationship was further influenced by the level of trust and quality of services at tertiary education institutions [6]. Another study comparing South Korea and Turkey highlighted the different factors affecting the acceptance of digital tax filing systems and the varying user satisfaction levels in both countries [8]. China, for instance, implemented the GTP III system, which has enhanced tax compliance for companies. This digital move reflects the potential of technology to streamline complex bureaucratic processes [9]. While the shift towards a digital tax platform has facilitated processes for governments and individuals alike, some major corporations have been slower and more hesitant to adopt digital tax return filing methods. The promise of digital tax systems, such as improved tax compliance, hasn't been universally realized, especially in developing nations. A primary hurdle, as evidenced in a Nigerian study, is the inadequacy of the IT infrastructure [10], a sentiment echoed by Chen [11].

Recent research in Jordan, such as the work by Al-Fraihat et al. provides additional insights into the utilization of eTax systems during the COVID-19 pandemic, highlighting the impact of such systems under extraordinary circumstances [12].

2.3 Theoretical framework and research hypotheses

Several research studies seek to justify the acceptance of the technology. Therefore, this study presents an integrated model from a set of theories, Social Capital Theory (SCT), Theory of Reasoned Action (TRA), and Technology Acceptance Model (TAM), to examine the factors that influence the acceptance and use of the Jordanian digital tax platform by taxpayers.

The first model, Social Capital Theory (SCT), explains the relationships between people, such as teamwork and community participation [13]. Incorporating recent findings, Al-Okaily provides insights into e-satisfaction and e-loyalty towards e-wallet apps, reflecting the social dimensions in digital technology adoption [14]. Figure 1 [15] illustrates the integrated model that underpins the research hypotheses of this study.

The second model is the Technology Acceptance Model (TAM). The primary objective of TAM is to predict the acceptance of information systems. TAM assumes that when a user encounters new information systems technologies, there are two main factors that influence how and when the system is used. These two main structures of TAM are perceived usefulness (PU) and perceived ease of use (PEOU) [16]. Further, Al-Kofahi, Shiyyab, & Al-Okaily's (2023) study on user satisfaction with financial information systems in emerging markets like Jordan adds to our understanding of TAM in different cultural contexts [17]. The third model is the Theory of Reasoned Action (TRA) which addresses the effects of cognitive components, such as attitudes, social norms, and intentions to behave [18–20]. Alalwan et al.; Alkhwalidi et al. have further explored these aspects in the context of Jordan, examining how cognitive and social factors influence the adoption of digital services [21, 22].

This section outlines the theoretical framework and research hypotheses for investigating the acceptance and use of the Jordanian digital tax platform. The integrated model combines Social Capital Theory (SCT) [23, 24], Technology Acceptance Model (TAM) [16, 25, 26], and Theory of Reasoned Action (TRA) [19, 20, 26] to analyze the factors influencing user behavior. The model focuses on social connections, perceived usefulness, perceived ease of use, attitudes, social norms, and intentions. The visual representation of the integrated model is presented in Fig. 1.

The study incorporates Social Capital Theory (SCT) to underscore the social dimension's significance in the acceptance and usage of the Jordanian digital tax platform. SCT, focusing on social relationships and community participation, explores how collaborative efforts among taxpayers influence their adoption of the electronic tax system [23, 27–29]. This inclusion recognizes that technology adoption is shaped not only by individual perceptions but also by social connections and shared experiences [24].

The Technology Acceptance Model (TAM), a well-established framework for understanding information systems adoption, is employed in the study to emphasize perceived usefulness (PU) and perceived ease of use (PEOU) as crucial factors in digital tax platform adoption [30, 31]. The researchers acknowledge that users' perceptions of the platform's utility and ease of use are key determinants, with positive perceptions likely contributing to higher levels of acceptance and integration into tax-related activities [32, 33].

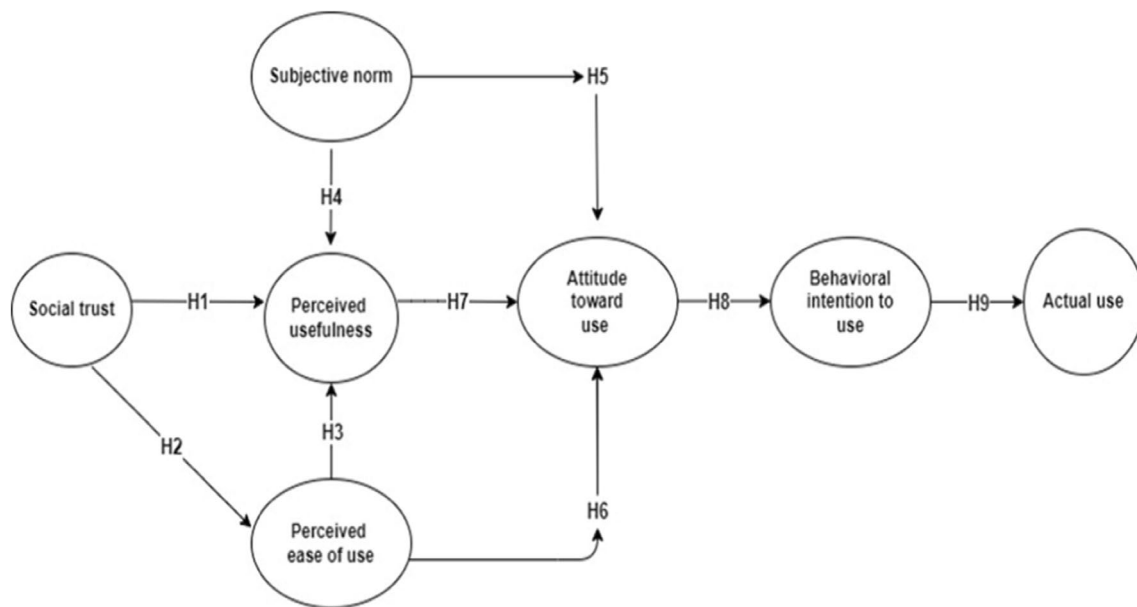


Fig. 1 Theoretical research model (source [15])

The Theory of Reasoned Action (TRA) introduces a cognitive perspective, emphasizing attitudes, social norms, and behavioral intentions in the study [26, 34]. TRA explores how taxpayers' past attitudes and intentions contribute to their decision to adopt or reject the digital tax platform, recognizing the importance of internal cognitive factors in shaping technology adoption [35].

The integration of SCT, TAM, and TRA into an overarching model provides a comprehensive framework for understanding the complexities of technology adoption in Jordan's digital tax services [36–38]. Multiple factors, including social, technological, and cognitive elements, interact to influence taxpayers' decisions. The visual representation of the integrated model, as presented in Fig. 1, forms the basis for the research hypotheses, offering a holistic perspective that transcends individual theories. The combined use of these theories implies a nuanced and thorough examination of the diverse factors shaping user behavior and adoption patterns in the digital tax domain.

SCT asserts that social relationships are resources that can lead to the development and accumulation of human capital [39]. SCT refers to the total of actual or potential resources associated with having a permanent network of institutional relationships to some degree of an acquaintance or mutual recognition [40]. Therefore, from the SCT, this study selects social trust as a determinant for the targeted behavior. According to Mcknight, Carter [41], the concept of trust in technology refers to the beliefs that indicate that a particular technology has the features necessary to perform as expected in a particular situation and is examined according to economic or social psychological perceptions.

Social trust is recognized as an important factor that affects people use of technology [23, 42]. Moreover, social trust is recognized as an important factor in that people perceive technology's usefulness and ease of use [40]. Several previous studies have combined social capital theory with TAM. As explained by Gefen et al. [43], trust positively affects perceived usefulness. In the same vein, Harrigan et al. [44] sought to understand the factors that influence purchases from social networking sites and found that the level of trust generated by peer communication would result in a higher perceived benefit. Also, Schaupp et al. [45] found that social trust is one of the factors affecting taxpayer perceptions about the perceived usefulness of the IRS tax system adoption in the USA. Based on that, the first hypothesis can be stated as follows:

- H1: High social trust leads to high perceived usefulness.

Tsai [46] shows that social capital factors (social trust, institutional trust, and social engagement) significantly and positively influence technology perceived ease of use and perceived usefulness. Trust was also positively correlated with ease of use in the context of B2C, where the results indicated that customers reach a high degree of trust in e-commerce if they have more experience in using the web of these sites [47]. In a study that examined the factors

in adopting e-government in Jordan, citizens' trust in e-government adoption in Jordan was related to the ease of web design and ease of use [48]. Nofal et al. [49] also found a significant correlation between trust and perceived ease of use in citizens' adoption of e-government services in Jordanian public sector institutions, where trust plays a mediating role between perceived ease of use and e-government adoption. Based on that, the second hypothesis can be stated as follows.

- H2: High social trust leads to high perceived ease of use.

Any successful application of information systems depends on the extent to which such a system is used and ultimately adapted by potential users [33, 50]. The TAM model is used to understand how end users make decisions about the use of technology applications [51]. TAM suggests that when introducing new technology to users, a number of factors determine their decision to use it [52]. TAM postulates that when a user encounters new technologies, there are two main factors that influence how and when they use the system. These two main factors of TAM are perceived usefulness and perceived ease of use [53].

Therefore, this study identifies perceived usefulness, perceived ease of use, and actual use behavior as determinants of the target behavior [15]. Perceived usefulness has been defined by Davis, Bagozzi [53] as "the degree to which a person believes that the use of a particular system would enhance his functional performance." Perceived ease of use refers to the extent to which technology allows users to complete tasks faster, improve productivity, and improve performance and efficiency [54, 55]. Venkatesh and Davis [56] found that the ease of use of new information systems has a direct positive effect on user acceptance through perceived usefulness. Also, Al Shibly and Tadros [57] found in a study on employee perceptions towards e-government systems that the perceived ease of use will have a positive impact on the perceived usefulness in the field of e-government system implementation.

A study that examined the determinants of e-government adoption, testing the intermediate effects of perceived benefit and perceived ease of use, found that perceived ease of use has a significant positive effect on perceived benefit [58]. Many studies have supported this significant effect [59–61]. The following hypothesis can be stated:

- H3: High perceived ease of use leads to high perceived usefulness.

TRA suggests that a person's behavior is determined by their intention to perform the behavior and that this intention is a function of their attitude toward the behavior and subjective norms [20, 62]. The theory aims to explain the relationship between attitudes and behaviors within human action and is used to predict how individuals will act based on their past attitudes and behavioral intentions. An individual's decision to engage in a particular behavior is based on the outcomes that the individual expects as a result of performing the behavior [63]. Therefore, from the TRA, this study selects the subjective norms, attitude toward use, and intention to use as determinants for the targeted behavior. According to Olson and Maio [64], TRA is a general model concerned with the intended behavior of individuals. According to the TRA, the behavior of an individual is determined by the individual's attitude and subjective norms with respect to the behavior. In addition, the individual's beliefs and motivations interact with the behavior.

The TRA addresses the effects of cognitive components, such as attitudes, social norms, and intentions, on behaviors [18]. Behavioral intentions are motivational factors that capture how hard people want to attempt a behavior [65]. The situation involves judging whether the behavior is good or bad and whether the actor supports or opposes it [66]. Subjective norms relate to social influences/perceived stressors to engage or not engage in a particular behavior [67]. Subjective norms reveal individuals' beliefs about how they would be seen by their groups if they performed a particular behavior [68]. In addition, Amron et al. [69] consider subjective norms to be forms of social pressure exerted by others. A subjective norm is a normative influence exercised on individuals to act in a particular way by important others such as colleagues, family members, and others [70].

Subjective norm has been reported to positively affect perceived usefulness [71]. During the process in which users include the reference group's belief pertaining to the information system's usefulness as a part of their own belief system, an awareness of usefulness was seen to be solidified through normative influence exercised on individuals to act in a particular way by important others [56].

Lee [72] found that the effects of subjective norms significantly affect the construction of individuals' perceived interest in a particular behavior. In a study on the determinants of the perceived usefulness of social media in university libraries, the results showed that the subjective norm positively affected the perceived usefulness of social media in university libraries [73]. Venkatesh and Bala [74] conducted integrated research on the use of information technologies

in the workplace, combining TAM and TRA and found that subjective norms are directly related to perceived usefulness and ease of use. The following hypothesis can be stated:

- H4: High influence from subjective norms leads to high perceived usefulness.

The attitude towards a particular behavior depends on the subjective norms”?

Awadallah [62]. Two vital signs that influence intention to use are attitude toward behavior and subjective norms; where a person perceives that their performance of a particular behavior is considered a positive action, it is likely to influence their intention to engage in that behavior [75]. The effect of perceived ease of use on behavioral attitudes was also positively confirmed by [54]. Attitude is the degree of interest associated with an individual's actual behavior, which increases a person's willingness to accept new technology [76].

Chow and Chan [77] found a positive relationship between subjective standards and their consequent positive attitude toward use in relation to organizational knowledge sharing and exchange among management. In a study that examined the role of national culture and sustainable consumption, the results showed that there is a positive relationship between subjective standards and subjective attitudes; as sustainable consumption increases, sustainable attitudes become more positive [78]. In a study examining the factors that predict students' behavioral intentions towards the continuous use of mobile learning, the results showed an important relationship with statistical significance between subjective rules and the attitude toward mobile learning [79]. The following hypothesis can be stated:

- H5: High influence from subjective norms leads to a highly positive attitude toward use.

In a study of the variables that influence individuals' intention to continue using mobile banking in Pakistan, Raza et al. [80] found that perceived ease of use and perceived usefulness favorably support the attitude towards using mobile banking. While in another study in Malaysia, perceived usefulness was found to be a good predictor of attitude towards laptop use, while perceived ease of use did not directly influence user's attitude about using a laptop [81]. In addition, Nadim and Noorjahan [82] conducted a similar study in the context of electronic banking services, where the results indicated that the perceived usefulness and ease of use are positively related to the customer's attitude and adaptation towards electronic banking services. On the other hand, the results of a study on the adoption of online shopping for airline tickets showed that perceived usefulness influences attitudes towards the airline ticket reservations more than the perceived ease of use [83]. Based on that, the hypothesis can be stated as:

- H6: High perceived ease of use leads to a highly positive attitude toward use.
- H7: High perceived usefulness leads to a highly positive attitude toward use.

Anouze and Alamro [84] found that the attitude of Jordanian consumers has significant and positive effects on the intention to use internet banking services, which supports the actual use of internet banking services. Bhuasiri et al. [7] found that a positive attitude toward use is an important indicator of influencing users' intentions to adopt an electronic tax payment and filing system.

The importance of behavioral intention as an indicator of individual behavior is well documented in the accounting literature [85]. This relationship is also emphasized in the theoretical models of TRA and TAM [53]. Intention to use is defined by Teo and Zhou [86] as "reflecting the user's desire to use the technology in the future". According to Joo et al. [87], the intent to adopt is a psychological status that occurs before a person adopts a new technology. Behavioral intention is used to define the intention to use a service, which is defined as the strength of an individual's intention to perform a specific behavior [85].

Liang and Lu [88] found that a positive attitude toward use affects people intention to adopt the online tax filing system through a questionnaire distributed to internet users who qualify as taxpayers. Finally, two hypotheses were developed.

- H8: A high positive attitude toward use leads to the behavioral intention to use.
- H9: High behavioral intention to use leads to high actual usage.

3 Research methodology

3.1 Research design

This study examines the behavioral factors that influence the actual use of the Jordanian digital tax platform by a sample of Jordanian taxpayers. Specifically, a quantitative approach was employed for this research design, with a questionnaire serving as the primary data collection tool.

3.2 Population, sampling procedure, and response rate

The research sample consisted of taxpayers who use the electronic tax platform in Jordan, with a focus on various taxpayers such as employees, business owners, and tax consultants. A random sampling technique was used to ensure unbiased and representative data [89]. To elaborate on the sampling process, participants were identified and contacted using a stratified random sampling method. This involved generating a list of taxpayers registered on the platform and selecting participants randomly across different taxpayer categories. Contact details were obtained through the platform's user database, and invitations to participate were sent via email. Data collection spanned 2 months, from June 2022 to July 2022. The questionnaire was created using Microsoft Office Forms and was distributed electronically to the participants. Responses were collected online through the same platform. Of the 484 returned questionnaires, 90 were excluded due to not meeting predefined criteria, such as relevance to the study's objectives and completion rate. This left a total of 394 valid responses for further analysis, as detailed in Table 1.

3.3 Questionnaire design

The questionnaire was segmented into three parts. The first section captured demographic details such as gender, age, educational qualifications, types of income (e.g., salary, business profits, rent), and the nature of the respondent's tax file. The subsequent sections delved into aspects like social trust, subjective norms, perceived benefits, perceived ease of use, attitude to use, intention to use, and actual use. The design and validation of the questionnaire involved a pilot test with a small group of taxpayers and a review by 12 accounting researchers, leading to refinements in question wording and structure.

For the response scale, a five-point ordinal scale was chosen, ranging from "strongly disagree" to "strongly agree". This scale was selected due to its simplicity and its ability to capture a nuanced range of respondents' attitudes effectively.

To enhance cultural relevance, the questionnaire was drafted in Arabic and reviewed by 12 accounting researchers for content validity. For validity and relevance, the survey was forwarded to 12 accounting researchers for review. Their feedback was invaluable, and subsequent revisions were made to ensure the validity and reliability of the questions. Actual survey items are shown in the appendix.

4 Data analysis and results

The PLS-SEM has been adopted in Smart-PLS, version 3.0, to test the hypotheses of the study. According to Hair and Ringle [90], this approach is used to measure behavioral and social phenomena so that the tool can model latent variables, correct measurement errors, and evaluate all parameters of the model simultaneously.

Table 1 Sample study response rate (n = 394)

Questionnaire response	Frequency	Rate %
Returned questionnaires	484	100
In completing questionnaires	89	19
Usable questionnaires	394	81

4.1 Partial least squares (PLS) technique

The PLS-SEM method is very attractive to many researchers because it enables them to estimate complex models with numerous constructs, indicator variables, and structural pathways without imposing distribution assumptions on the data [91]. Also, PLS-SEM is a causal-predictive approach that emphasizes prediction in estimating statistical models, which structures are designed to provide causal explanations [92].

4.2 Demographic data

As shown in Table 2, the percentage of males subject to tax is higher than that of females in Jordan. Most respondents are between the ages of 30–45 years. Nearly half of the respondents, 55%, hold a bachelor's degree. Most of the respondents came from the service sector, with 38%. In addition, most respondents 65% are subject to income tax declaration only. This demographic composition might influence the study's outcomes, suggesting potential generational and gender-based differences in digital platform usage. The demographic skew could impact the generalizability of findings, particularly in contexts where digital literacy and access vary across different age groups and genders.

Table 2 Respondents' demographic information (n = 394)

	Frequency	Percentage
Gender		
Male	284	72
Female	110	28
Total	394	100
Age		
Below of 30	55	14
30–35	87	22
35–40	125	32
40–45	81	23
45 or Above	46	12
Total	394	100
Qualifications		
Secondary	10	3
Diploma	29	7
Bachelor	218	55
Master	104	26
PhD	33	8
Total	394	100
Experience		
Service	151	38
Commercial	76	19
Industrial	45	11
Contracting–Housing	44	11
Professional craft	23	6
Other	55	14
Total	394	100
Tax return type		
Income return	258	65
Sales return	13	3
Income return + sales return	123	31
Total	394	100

4.3 Data analysis (evaluation of PLS-SEM results)

Construct measures were evaluated for their reliability and validity to examine the structural models and the relationships between the underlying variables. This study applied PLS-SEM to both external (measurement model) and internal (structural model) models.

4.4 Multicollinearity test

The first stage is to evaluate the results of the structural model in relation to collinearity problems. A multicollinearity relationship is a relationship between two or more external variables in which the independent variables have a high relationship with other independent variables [93]. If the VIF values of the indicators are higher than five, this leads to a collinearity problem [94]. Table 3 indicates no collinearity problems.

4.4.1 Measurement model assessment

One of the justifications for using Smart-PLS is the possibility of assessing and confirming the validity and reliability of the measurement model by evaluating: (1) the reliability of the internal consistency; (2) the Reliability of the indicator; (3) Convergent validity; and (4) the ability to discriminate. The following sections present the results of all analyses to assess the measurement model's validity and reliability.

4.4.2 Internal consistency reliability

According to Hair Jr. [95], the measurement model is considered to have satisfactory internal consistency reliability when the composite reliability of each structure exceeds a value of 0.7. Table 4 shows that (CR) for each structure in the study ranged from 0.844 to 0.933. These results indicate that the constructs' items constitute satisfactory internal consistency reliability.

Table 3 Multicollinearity test

Construct	Code	VIF
Attitude To use	ATU1	1.781
	ATU2	2.182
	ATU3	1.736
Actual use	AU1	2.15
	AU2	1.699
	AU3	2.029
Behavioral intention to use	IT1	1.445
	IT2	1.576
	IT3	1.333
Perceive ease of use	PEU1	2.389
	PEU2	3.369
	PEU3	2.641
Perceive usefulness	PU1	1.832
	PU2	2.352
	PU3	1.894
Subjective norms	SN1	1.851
	SN2	1.845
	SN3	1.665
Social trust	ST1	1.667
	ST2	1.963
	ST3	2.096

Table 4 Measurement scales, reliability, and convergent validity

Construct	Code	Loadings	Cronbach alpha	CR	AVE
Attitude toward use	ATU1	0.847	0.819	0.892	0.734
	ATU2	0.897			
	ATU3	0.825			
Actual use	AU1	0.892	0.830	0.898	0.747
	AU2	0.833			
	AU3	0.867			
Behavioral intention to use	IT1	0.780	0.723	0.844	0.643
	IT2	0.851			
	IT3	0.773			
Perceive ease of use	PEU1	0.887	0.891	0.933	0.822
	PEU2	0.933			
	PEU3	0.898			
Perceive usefulness	PU1	0.847	0.834	0.901	0.751
	PU2	0.900			
	PU3	0.853			
Subjective norms	SN1	0.868	0.811	0.888	0.725
	SN2	0.847			
	SN3	0.841			
Social trust	ST1	0.807	0.824	0.894	0.739
	ST2	0.878			
	ST3	0.891			

4.4.3 Indicator reliability

According to Hair Jr. [95], the measurement model is considered to have satisfactory indicator reliability when the loading rating of each component is higher than 0.7. Whereas the reliability of the measurement model indicator is measured by examining loads of the elements. Looking at the analysis Table 4, all the elements in the measurement model showed loads more significant than 0.7, ranging from 0.773 to 0.933. Thus, all items used in this study show satisfactory indicator reliability.

4.4.4 Convergent validity

According to Hair Jr. [95], convergent validity is sufficient when the structures have an extracted mean–variance (AVE) value close to 0.5 or higher. Table 4 shows that all fixtures have an AVE value ranging from 0.643 to 0.822. Hence the measurement model shows sufficient convergent validity.

4.5 Discriminant validity

Discriminant validity expresses the degree to which items differ between constructs or measures distinct concepts. The Fornell-Larker criterion is the most traditional approach to assessing the validity of a distinction [15]. The Fornell-Larker Standard criterion for assessing the validity of the discriminant is based on elemental analysis, and the validity of the discriminant is confirmed when the square root of the AVE value of each structure is greater than the highest correlation of the construct with any other latent structure [96]. In this study, Table 5 and Fig. 2 show the results of evaluating the Fornell-Larker criterion with the square root for each construct with a correlation presented in the correlation matrix. It can be said that the discriminative validity of the construct was determined based on the instructions.

4.6 Structural model

After the evaluation and confirmation of the external model (measurement model), this part covers the requirements for evaluating the internal model (structural model) in terms of the model's predictability and the correlation

Table 5 Discriminant validity

Fornell-Larker criterion	Actual use	Perceive ease of use	Perceived usefulness	Social trust	Attitude toward use	Behavioral intention to use	Subjective norm
Actual use	0.864						
Perceive ease of use	0.629	0.907					
Perceived usefulness	0.676	0.662	0.867				
Social trust	0.621	0.609	0.677	0.859			
Attitude toward use	0.723	0.634	0.718	0.681	0.857		
Behavioral intention to use	0.768	0.591	0.653	0.560	0.659	0.802	
Subjective norm	0.603	0.468	0.588	0.601	0.561	0.534	0.852

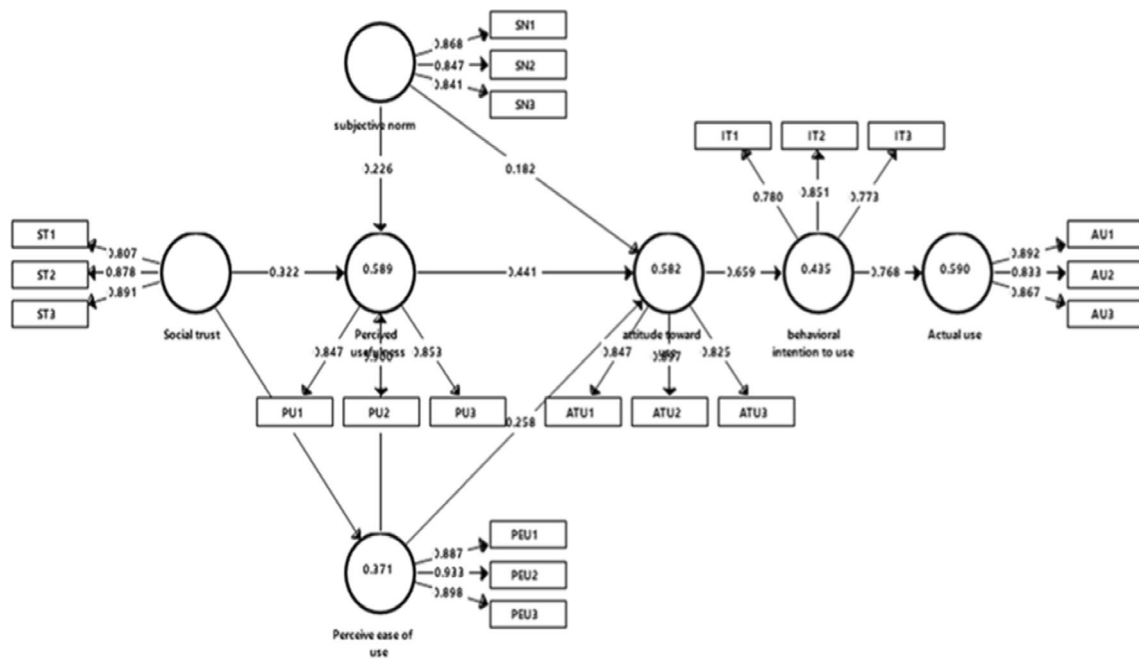


Fig. 2 Item loadings and R2 values

between the latent variables. This study applied these key factors to examine and evaluate the internal model. They are as follows: (1) the coefficient of determining the internal constructs (R²), (2) the effect size and the predictive significance or validated frequency (Q), (3) the fit of the model, and (4) the path coefficients and their significance (standard errors, significance levels, and values of t and p-values). The R² values, reflecting the variance explained by the independent variables in the dependent variables, were found to be substantial in some constructs and moderate in others, indicating that the model effectively explains a significant portion of the variance in the dependent constructs. Furthermore, the Q² values, which assess the model's predictive relevance for the dependent variables, were above the threshold value, indicating the model's adequacy in making predictions.

Regarding the model fit, the SRMR value was found to be within the acceptable range, suggesting a good fit between the model and the observed data. This reinforces the validity of the structural model in capturing the relationships among the constructs. Lastly, the path coefficients were analyzed, showing significant relationships between several constructs. The t-values and p-values associated with these path coefficients confirm the statistical significance of these relationships, thus supporting the study's hypotheses.

As a result, external model analysis confirms that survey items measure the constructs they were designed to measure. In other words, the items are trustworthy and reliable.

Table 6 R², R² Adjusted, and Q²

Variable	Variable type	R square	R Square adjusted	Q-square
Actual use	Endogenous	0.59	0.589	0.431
Perceive ease of use	Endogenous	0.371	0.369	0.299
Perceived usefulness	Endogenous	0.589	0.586	0.436
Attitude toward use	Endogenous	0.582	0.579	0.418
Behavioral intention to use	Endogenous	0.435	0.433	0.268

Table 7 Fit summary (SRMR)

	Saturated model	Estimated model
SRMR	0.059	0.059

4.6.1 Coefficient of determination (R-Squared)

In the PLS-SEM model, the structural model (internal loads) is evaluated by estimating the path parameters along with the value of R². While the path coefficients show the strength of the associations between the predictor and criterion constructs, the value of R² is a measure of the predictive intensity of a model for the normative (dependent) constructs, and it also provides the importance of the pathway coefficients in the model in support of the putative associations [97]. The structural model can be evaluated by its R² value, R-Square Adjusted value, and cross-validated frequency. These will be detailed in the coefficient of determination (R²) table for endogenous variables and is among the criteria most used in evaluating a structural model [15].

Specifically, the R-squared value of 0.67 or greater is considered significant at 0.33 it is considered moderate and at 0.19 it is considered weak [98]. In Fig. 2, it is found that the R² values of the internal variables, namely actual use, perceived ease of use, perceived usefulness, attitude to use, and behavioral intention to use, are as follows; 0.59, 0.371, 0.589, 0.582 and 0.435, and therefore these values are considered acceptable and average, which reflects the adequacy of the applied model.

4.6.2 Cross-validated redundancy (Q-Squared)

The structural model is also evaluated by the Stone-Geisser Q-test, which is another appropriate indicator of the model where the additional predictive values of the latent exogenous variables were measured using the Stone Geisser Q-test. It determines the model's capacity making a prediction of the parameter estimation using the blindfolding routine [99]. The blindfolding technique was used to determine the verified frequency Testing Q² values > 0, which means that the outliers have a predictive relevance to the internal construct under consideration [100].

In Table 6, we find that the estimated Q² values for the endogenous variables differ significantly above zero, in specific, 0.431 for actual use, 0.299 for perceived ease of use, 0.436 for perceived usefulness, 0.418 for attitude to use and 0.268 for behavioral intention which indicates a high predictive ability of the exogenous structures. Thus, these values are considered acceptable, which reflects the adequacy of the applied model.

4.7 Model fit

In addition to the reliability and validity of the measurement model, the researchers adopt the residual square root mean (SRMR) criterion as an additional structural model evaluation condition. The SRMR acts as an indicator to show the fit of the estimated model. SRMR stands for the square root of the sum of the squared differences between the implicit and empirical correlation matrices [101]. Table 7 shows that the study model SRMR = 0.059 is below the recommended threshold of < 0.132.

4.8 Assessing the inner model and hypotheses testing procedures

After confirming the appropriateness of the external situation, in PLS-SEM, the bootstrapping procedure should be performed along with the PLS algorithm to obtain the estimates between constructs in the well-known bootstrap method. Bootstrap samples are drawn from the same size as the original sample with replacement from the original sample, reflecting the drawing of samples from the base set [102]. PLS adopts proactive simulation to obtain parameter estimates and standard error for hypothesis testing. In order to stabilize parameter estimates, the sample iteration number was set at 5000 samples [100]. Similarly, for the one-tailed test, the path coefficient and smoothing results are shown in Table 8, where the putative relationships were tested.

In the structural model of this study, there are 9 direct hypotheses that address seven variables and were tested using PLS-SEM, with two external constructs tested against five endogenous constructs (actual use, perceived ease of use, perceived usefulness, attitude toward use and behavioral intention to use) in the first stage. In the second stage, the same five internal constructs were checked against perceived benefit, while in the third stage, the attitude to use was tested against the behavioral intention to use. Figure 2 shows that the fit scale in the final structural model fits well with three tracks at the 5% significance level ($p < 0.05$).

Table 8 shows that hypothesis 1 is supported and significant ($\beta = 0.322$, $T = 5.689$), which indicates that social trust among community members leads to high levels of perceived benefit and that Hypothesis 1 is acceptable. The same result was found in a study [45]. Also, it was found that social trust was significantly associated with perceived ease of use, which is addressed in hypothesis 2 ($\beta = 0.609$, $T = 14.487$), the positive coefficient sign showing the positive effect of social trust on perceived ease of use. This means that hypothesis 2 is accepted, and it is a similar result in the study [49]. Hypothesis 3 clarifies the effect of perceived ease of use on perceived usefulness, as the result supported this hypothesis ($\beta = 0.361$, $T = 6.308$), which showed a favorable and significant effect of perceived ease of use on perceived usefulness. The same result was found in a study [58].

Moving to hypotheses 4 and 5, the influence of subjective norms on perceived usefulness and subjective norms on attitude toward use is addressed while the results supported both hypotheses. Hypothesis 4 was accepted because the result shows a positive and significant effect between subjective norms on perceived usefulness ($\beta = 0.226$, $T = 5.168$). Meanwhile, hypothesis 5 was accepted because the result showed a positive and significant effect between subjective norms and attitude towards use, as it was found to be ($\beta = 0.182$, $T = 3.497$). The results of these two hypotheses were similar to Bonn et al. [103].

Furthermore, hypothesis 6 and hypothesis 7 are addressed to illustrate the effect of perceived ease of use and perceived usefulness on the attitude towards use. Returning to hypothesis 6, the results show that the hypothesis is supported ($\beta = 0.258$, $T = 4.268$) as the degree shows a positive and significant effect between perceived ease of use and attitude towards use. Hypothesis 7 also showed a positive and significant effect between perceived usefulness and attitude toward use ($\beta = 0.441$, $T = 6.967$), which means that the hypothesis is supported and accepted. The same result was found for the two hypotheses in the study [83].

Table 8 Hypotheses verification (direct relationships)

No	Hypotheses	Path coefficient	Std	T statistics (O/STDEV)	P-values	Decision
H1	Social trust → Perceived usefulness	0.322	0.057	5.689	0	Supported**
H2	Social trust → Perceive ease of use	0.609	0.042	14.487	0	Supported**
H3	Perceive ease of use → Perceived usefulness	0.361	0.057	6.308	0	Supported**
H4	subjective norm → Perceived usefulness	0.226	0.044	5.168	0	Supported**
H5	subjective norm → attitude toward use	0.182	0.052	3.497	0.001	Supported**
H6	Perceive ease of use → attitude toward use	0.258	0.06	4.268	0	Supported**
H7	Perceived usefulness → attitude toward use	0.441	0.063	6.967	0	Supported**
H8	attitude toward use → behavioral intention to use	0.659	0.047	14.001	0	Supported**
H9	behavioral intention to use → Actual use	0.768	0.046	16.557	0	Supported**

** $p < 0.01$

In addition, Hypothesis 8 was developed to clarify the relationship between attitude towards use and intention to use behavior. The results of the analysis showed that the hypothesis is accepted and supported ($\beta=0.659$, $T=14.001$), which means that the use attitude has a significant and positive influence on the behavioral intention to use. Finally, Hypothesis 9 explains the effect of intent to use on actual use behavior. Considering the results of the analysis, hypothesis 9 was accepted as a supported hypothesis between the intention to use and the actual use, and the result showed a significant and positive relationship ($\beta=0.768$, $T=16.557$). Hypotheses 8 and 9, their result is similar to Liang and Lu [88].

5 Conclusions and recommendations

5.1 Hypotheses discussion

This study presents a conceptual framework that takes into account a set of relationships based on an integrated model of SCT, TRA and TAM to understand the behavioral factors that influence the actual use of the Jordanian digital tax platform by Jordanian taxpayers. Based on the results of testing the nine hypotheses, the existence of a statistically significant relationship between the factors was confirmed, and the overall hypotheses of the study were supported. Each hypothesis result was supported by a similar result in previous research conducted.

Conclusions from the results of this study are: (1) Social trust has a positive and significant perceived usefulness effect for the use of the digital tax platform. This result means that the higher the mutual trust between members of the community to use the digital tax platform, the higher the rate of perceived usefulness from using it. (2) Social trust has a positive and significant effect on perceived ease of use. This result means that the higher the mutual trust among community members to use the digital tax platform, the higher the rate of perceived ease of use. (3) Perceived usefulness has a positive and significant effect on the perceived ease of use of the digital tax platform. This result means that the higher the perceived usefulness, the higher the perceived ease of use of the digital tax platform.

4) Subjective norms have a positive and significant effect on the perceived ease of use of the digital tax platform. This finding means that the higher a person's subjective norms, the higher the perceived ease of use of the digital tax platform. (5) The subjective norms have a positive and significant impact on the attitude toward the use of the digital tax platform. These results indicate that the higher the subjective norms, the higher the positivity in attitude toward the use of the digital tax platform. (6) The perceived usefulness has a positive and significant impact on the attitude toward the use of the digital tax platform. This result means that the higher the perceived usefulness, the more positive the digital tax platform will be used.

(7) The perceived ease of use of the digital tax platform has a positive and significant impact on the use of the digital Tax Platform. This result implies that a higher perceived ease of use correlates with a more positive attitude toward the use of the digital tax platform. (8) Attitude has a positive and significant effect on behavioral intention to use the digital tax platform. This shows that the higher the positive attitude use of the digital tax platform, the higher the behavioral intent to use the digital tax platform. (9) The behavioral intention to has a positive effect on the actual use of the digital tax platform. This indicates that the higher the behavioral intention to use the digital tax platform, the higher the actual use of it.

5.2 Implications

5.2.1 Theoretical implications

This study provides robust support for the integrated SCT, TAM, and TRA models as a model for examining behavioral factors that influence the actual use of the Jordanian Digital Tax Platform by Jordanian taxpayers. All findings and predictions of this study have been empirically tested and justified by the previous literature. This study made many theoretical and practical contributions. Thus, this contribution begins by providing current accounting research to expand its theoretical lenses to include research into the acceptance of electronic government platforms. The results indicate that the factors adopted in this study influence the actual use of the Digital Tax Platform. Thus, our main findings contribute to a better understanding of the process of widespread acceptance of the use of the Digital Tax Platform. Therefore, the results expand our awareness of the adoption process.

5.2.2 Practical implications

The findings of this study have substantial practical implications for a diverse range of stakeholders, including policymakers, investors, and platform developers, with a specific focus on Jordan. These practical implications encompass both contextual and managerial dimensions.

In terms of contextual implications, the insights derived from this research offer valuable guidance to Jordanian governmental organizations contemplating the adoption of new electronic platforms. The study's findings can aid these organizations in making well-informed decisions regarding the development and implementation of digital solutions. It is worth noting that the relevance of this research extends beyond the borders of Jordan, providing insights that can be applied to similar developmental contexts. Policymakers and investors, in particular, stand to benefit from understanding how electronic platforms can potentially impact government services in such contexts.

From a managerial perspective, Jordanian governmental organizations have the opportunity to enhance the quality of their online platforms based on the research findings. By doing so, they can increase their acceptance among citizens, ultimately leading to improved user experiences and facilitating more efficient government transactions online. Decision-makers are strongly advised to leverage the strengths of these platforms while proactively addressing any weaknesses identified in the research. This strategic approach will contribute to the development of an infrastructure that aligns seamlessly with the ongoing digital transformation and paves the way for the automation of government services.

5.3 Limitations and future research

This study's focus on Jordan raises questions about its generalizability to other contexts. While the governorates selected for the research are significant in terms of taxpayer population, they might not fully represent the diversity of the entire Jordanian demographic. Additionally, the reliance on a quantitative methodology, although effective for gathering structured data, might not capture the nuanced insights that could be gleaned from qualitative research. Furthermore, it is acknowledged that this study did not explore every potential variable that could impact the adoption of digital platforms.

For future research, a broader scope would be beneficial. Extending the study to include different countries could enhance the understanding of how cultural contexts influence the adoption of digital platforms. Adopting qualitative or mixed-methods approaches would allow for a richer, more holistic view of user behaviors and attitudes. The integration of diverse theoretical frameworks, such as the Technological, Organizational, and Environmental (TOE) framework, could provide a deeper understanding of the factors influencing digital platform adoption. Additionally, examining the perspectives of varied groups, including tax department employees and individuals from different socio-economic backgrounds, would offer a more comprehensive insight into the dynamics of digital platform adoption in government contexts.

This approach to future research would not only address the limitations identified but also open new avenues for understanding the complex nature of digital platform adoption in various settings.

Acknowledgements The authors would like to express their gratitude to the EIC, AE, and reviewers.

Author contributions SAS: Conceptualization; Data collection, project administration, supervision, writing—original draft, writing—review and editing. HA: Formal analysis, data collection, investigation, methodology, and writing—original draft. MA: Resources, validation, writing—review and editing. MS: Software, writing—review and editing. All authors read and approved the final manuscript.

Funding Not applicable.

Data availability The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate This study, involving a survey of taxpayers in Jordan, was meticulously conducted in strict adherence to recognized ethical standards, aligning with the principles of the 1964 Helsinki declaration and its subsequent amendments or comparable ethical standards. Given the specific nature of this study, formal approval from an ethics committee or Institutional Review Board (IRB) was deemed not necessary. This decision was based on the study's methodology, which did not involve any invasive procedures or the collection of sensitive personal data beyond what participants were willing to share within the context of an informed consent process. Despite the absence of formal ethics committee or IRB approval, comprehensive measures were taken to ensure the ethical integrity of the study. Informed consent was directly obtained from all individual participants included in the survey. Prior to their participation, all respondents were thoroughly informed about the study's objectives, the nature of the data being collected, and how this data would be used. We guaranteed the

confidentiality and anonymity of all participants' responses throughout the research process. This was done to ensure that the data collected were used exclusively for the purposes of this study, with no other ulterior motives. The ethical approach adopted for this study was designed to respect the dignity, rights, and welfare of all participants, ensuring that the research was conducted responsibly and ethically, even in the absence of formal ethics committee or IRB oversight. Informed consent was obtained from all individual participants included in the study.

Competing interests The author declare that they have no competing interests.

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Appendix

Measurements and operationalization

Construct	Items	References
Social trust	I trust the tax platform to keep my personal information	[23, 42, 104]
	I would base an financial decision on the output I received from the tax platform	
	The tax platform has high integrity	
Subjective norms	Influential people think that I should use tax platform	[40, 74, 105]
	People around me have encouraged me to use tax platform	
	Most of my friends are adopted to tax platform	
Perceived usefulness	The use of tax platform will improve my performance in lodging tax declaration	[40, 106–108]
	The use of tax platform makes it easy to pay tax	
	The use of tax platform supports an important part of my financial matters	
Perceived ease-of-use	Interactive with tax platform is clear and understandable	[40, 106–108]
	Using tax platform is easy for me	
	It will be easy for me to become proficient in using tax platform	
Attitude to use	I always prefer to use tax platform	[40, 105, 107]
	I am positive about adopting tax platform	
	I think the adoption of tax platform is a good idea	
Intention to use	I will permanently continue to use tax platform	[40, 105–107, 109, 110]
	I intend to use tax platform whenever possible	
	I intend to increase my use of tax platform in the future	
Actual use	How often do you use tax platform?	[40, 111, 112]
	I use tax platform whenever possible	

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